WF-600T Series

Pure Sine Wave Power Inverter User's Manual

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1. Important Safety Instructions

WARNING !
Before you install and use Your WF-600T Inverter, be sure to read these safety instructions.

1-1. General Safety Precautions

1-1-1. Do not expose the WF-600T inverter to rain, snow, spray, bilge or dust. To reduce risk of hazard, do not cover or obstruct the ventilation openings. Do not install the WF-600T Inverter in a zero-clearance compartment. Overheating may result.

1-1-2. To avoid a risk of fire and electric shock. Make sure that existing wiring is in good electrical condition; and that wire size is not under sized. Do not operate the WF-600T inverter with damaged or substandard wiring.

1-1-3. This equipment contains components which can produce arcs or sparks. To prevent fire or explosion do not install in compartments containing batteries or flammable materials or in locations which require ignition protected equipment. This includes any space containing generator, fuel tanks, or joints, fittings, or other connection between components of the fuel system.

1-2. Precautions When Working with Batteries

1-2-1. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 20 minutes and get medical attention immediately.

1-2-2. Never smoke or allow a spark or flame in vicinity of battery.

1-2-3. Do not drop a metal tool on the battery. The resulting spark or short-circuit on the battery or other electrical part may cause an explosion.

1-2-4. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery.
A lead-acid battery produces a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.

2. Functional Characteristics

2-1. General Information

WF-600T complies with stand–alone power inverter with AC transfer switch and is suitable for RV, Marine and Emergency application. When utility AC power cutoff, the transfer relay is de-energized and the load is automatically transferred to the WF-600T series output. Once the AC utility is restored, the relay is energized and the load is automatically reconnected to AC utility.

WF-600T series is available with 12 (24) Vdc Input and 120 Vac / 60 Hz Output and there are 2 versions:

- With Hardwire (Part No. WF-600TH-1XX)
  --- provide with hardwired installation.

- With GFCI (Part No. WF-600TG-1XX)
  --- This provides with the GFCI safety receptacle easier to plug in the appliances.

Please read all instructions and cautionary marking on this manual before using WF-600T series.

2-2. Features

Product:

- 600Watt continuous output with 800Watt power surge for electronic appliances
- Pure sine wave output (THD < 3%) to operate higher-end electronic Equipments.
- Built in 10A rating transfer switch with plug-in socket that is easy to maintain.
- Speed up transfer time and synchronized operation with the AC source at all times that allows the transfer to be interruption-free for sensitive equipments
- Built in advance microprocessor to make friendly interface with user.
- Dual AC outlets or hardwire AC connection model option.
- Smart remote controller.
- 3 LED indicators with tri-color display all operation status
- UL 458 approval and FCC class B.

Protection:

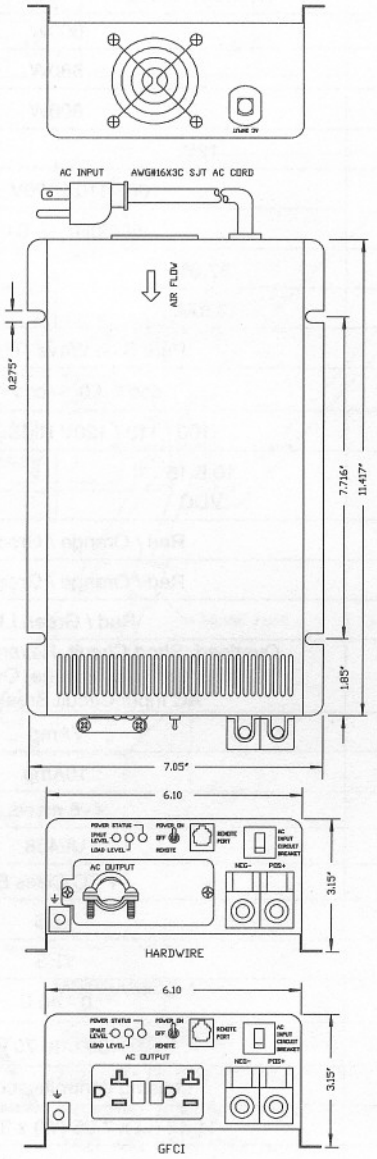
- Battery over voltage and under voltage protections.
- Over temperature protection.
- Over load protection
- Short Circuit protection
- Ground fault protection by GFCI receptacle.
- Reverse polarity protection .
- ROF (remote override function) or Ignition Lockout function option.
- AC circuit breaker (7Amp)

2-3. Electrical Performance

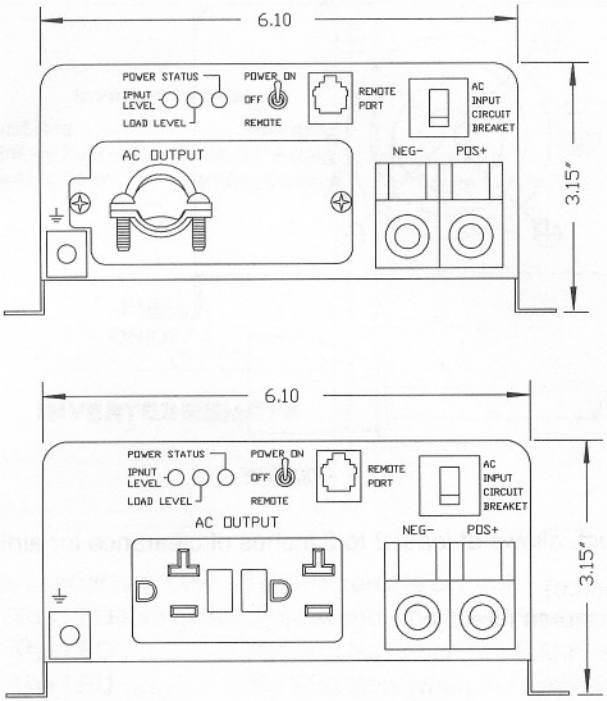
Specification	Model No.	Model No.
Item	WF-600T□-112	WF-600T□-124
Continuous Output Power	600W	
Maximum Output Power (3Min.)	680W	
Surge Rating	800W	
Input Voltage	12V	24V
Output Voltage / Frequency (Switch Selectable)	100 / 110 / 120V ± 3%	
	50/60Hz +/- 0.05%	
Efficiency (full load)	87.0%	90.0%
No Load Current Draw	0.87A	0.43A
Output Waveform	Pure Sine Wave (THD <3%)	
Power Factor Allowed	cos θ -90° ~ cos θ +90°	
Output Voltage Regulation	100 / 110 / 120V RMS –10%/+4%	
Input Voltage Regulation	10.5-15 VDC	21.0-30 VDC
Input Level Indicator	Red / Orange / Green LED	
Load Level Indicator	Red / Orange / Green LED	
Power Status	Red / Green LED	
Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over/Under Input Voltage, Over Temperature. AC Input Circuit Breaker, GFCI.	
Circuit Breaker	7Amp	
Transfer switch	10Amp	
Transfer Time	4~8 msec.	
Safety	UL458	
EMC	FCC Class B	
Remote Control	YES	
Synchronous AC transfer	YES	
Operating Temperature Range	0 - 40℃	
Storage Temperature Range	-30℃ to 70℃	
Cooling	Loading controlled cooling fan	
Dimensions	11.42 (L) x 7.05 (W) x 3.15 (H) Inch	
Weight	3.3 kgs. / 6.6 Lbs.	

3. Basically Descriptions

3-1 *Mechanical drawings*



3-2 *The Front panel interface*



3-2-1. Power ON / OFF / REMOTE switch:
If you use a remote control unit, put the “on/off “ switch to “remote”.

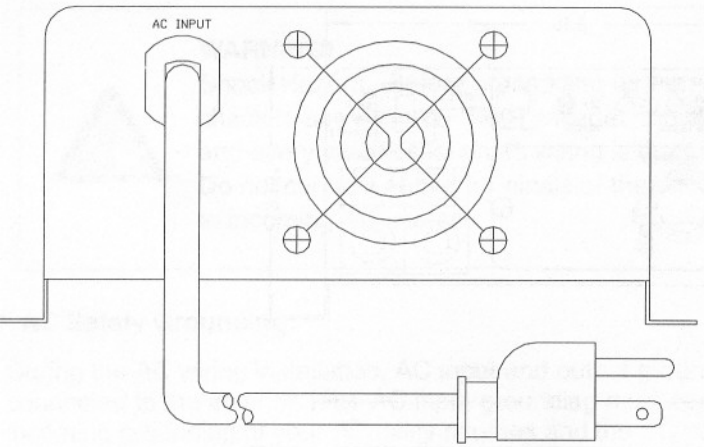
3-2-2. AC input Circuit Breaker:
The 7Amp circuit breaker protects the model from overload. When an overland condition exists, the circuit breaker stops to supply output AC grid power. To reset, push the circuit breaker switch and then the model will be back to a normal operation, the source fault should be corrected prior reset.

3-2-3 Remote port: Connect RJ-11 wiring with remote control unit.

3-2-4. Battery terminals:
Connect 12V (24V) batteries or other 12V / (24V) power sources.

3-2-5. Connect chassis ground terminal to earth.

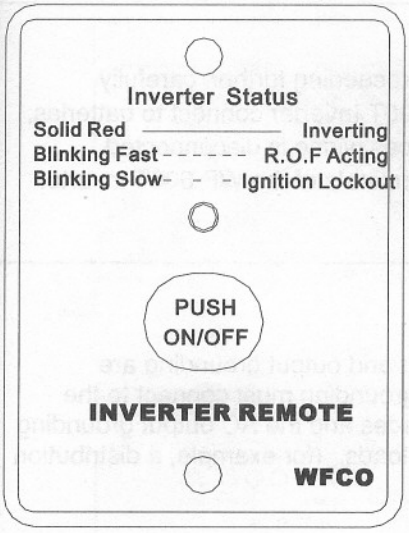
3-3 *The rear panel interface*

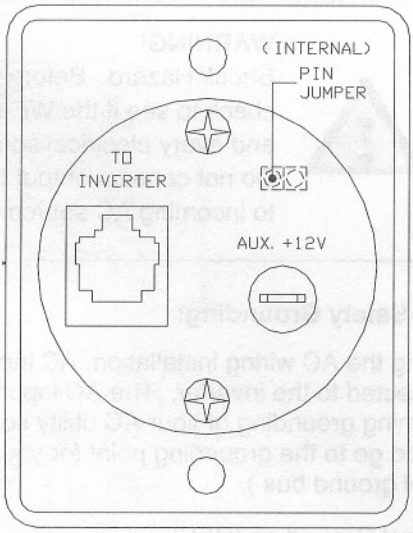


3-3-1. Ventilation:
Do not obstruct, allows at least 2 to 3 inches of clearance for airflow.

3-3-2. AC input: (source)
Plug into AC source directly.

3-4 *The Remote Control panel*





Remote control is a basic ON/ OFF remote control.

- ∗ The LED that glows steadily red when the Inverter is on.
- ∗ The LED .....Blinking fast when the **R.O.F** is presented.
- ∗ The LED .....Blinking slow when the **Ignition Lockout** function is presented.

—*The Jumper wire* that is placed inside the remote control and decides to present either the **R.O.F** or **Ignition lockout** function.

- ∗ Pin jumper "Open" - **R.O.F.**
- ∗ Pin Jumper "Short" - **Ignition lockout function.**

—*The wire* must be placed with a properly sized 12 Volt fuse.

—*Connect RJ-11* wire with the remote port in front of panel.

- ∗ **Ignition Lockout** function –The **Ignition lockout** function is to turn the Inverter OFF when the auxiliary input wiring connects with the ACC and 12 Volts is applied.

- ∗ **R. O. F** -The **R.O.F (Return override function)** is to turn the Inverter ON when the auxiliary input wiring connects with the reverse gear Shift and 12 Volts is applied.

4. Installation

WARNING!
Shock Hazard. Before proceeding further, carefully check to see if the WF-600T Inverter connect to batteries, and every electrical sources wiring is disconnected. Do not connect output terminals of the WF-600T Inverter to incoming AC source.

4-1 AC Safety Grounding:

During the AC wiring installation, AC input and output grounding are connected to the inverter. The AC input grounding must connect to the incoming grounding of your AC utility sources and the AC output grounding should go to the grounding point for your loads. (for example, a distribution panel ground bus).

Neutral Grounding (GFCI'S):

The neutral conductor of the AC output circuit of the WF-600T Inverter is Automatically connected to the safety ground during inverter operation. This conforms to National Electrical Code requirements that derived AC sources separately (such as inverter and generators) have their neutral conductors tied to ground in the same way that the neutral conductor from the utility is tied to ground at the AC breaker panel.
For models configured with a transfer relay, while AC utility powers presenting and he WF-600T Inverter is in bypass mode, this connection (neutral of the WF-600T Inverter's AC output to input safety ground) is not presented so that the utility neutral is only connected to ground at your breaker panel, as required.

4-2 Ground Fault Circuit Interrupters (GFCI):

Recreational Vehicles Installations (for North American approvals) will require GFCI protection, all branch circuits connected to the AC output hardwire terminal is equipped WF-600T Inverter. In addition, electrical codes require GFCI protection of certain receptacles in residential installations.

While the pure sine wave output of the WF-600T Inverter is equivalent to the waveform provided by utilities, compliance with UL standards requires us to test and recommend specific GFCI.

WFCO has tested the following GFCI-protected 20A receptacles, UL listed, Pass & Seymour, type no. 2091-W & 2094-W , and found that they functioned properly when connected to the output of the WF-600T Inverter.

4-3 Hard-wire Installation

To make AC wiring connections:

4-3-1. The AC wiring compartment is located on the front panel of the WF-600T. Remove the AC wiring compartment cover to gain access to the AC terminal.

4-3-2. Connect to the AC output wiring to the WF-600T AC output terminals. Terminal to wiring connections refer to the following mentions:

Terminal	Wire color	Wire length / gauge
Line (L)	Black	Within 16 feet / AWG# 16~18 16 ~ 32 feet / AWG# 14~16
Neutral (N)	White	
Ground	Green / Yellow or Bare copper	

4-3-3. After wiring, double check and review all connections to make sure the wires are in correct terminals and the terminals are tight up.

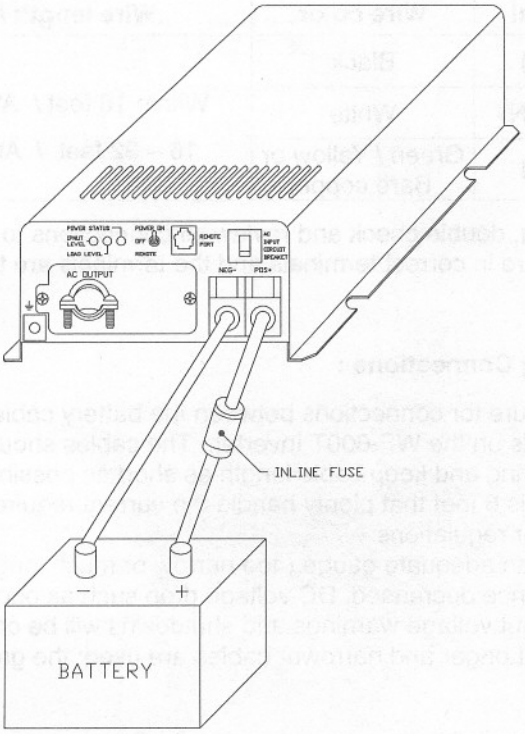
4-4 Making DC Wiring Connections :

Following procedure for connections between the battery cables and the DC input terminals on the WF-600T Inverter. The cables should be high quality copper wiring and keep cable length as short as possible, the maximum length is 6 feet that plenty handle the current required from the electrical codes or regulations.
If cables are not an adequate gauge (too narrow or much longer), the inverter performance decreased, DC voltage drop such as poor surge capability, low input voltage warnings and shutdowns will be caused frequency so the Longer and narrower cables are used; the greater voltage drop is caused.

Battery cable fusing --- A fuse is required by the National Electrical Code (NEC) to protect the battery and cables, A UL listed DC rated slow blow fuse must be installed in positive battery cable, within 18 inches of the battery.

WFCO recommends the following cables for an optimum inverter performance.

Model No	Wire AWG	Inline Fuse
WF-600T□-112	# 4	100A
WF-600T□-124	# 6	50A



WF-600T

WARNING !

The installation of a fuse must be on positive cable. Failure to place a fuse on "+" cables running between the Inverter and battery may cause damage to the inverter and will void warranty.

5. Operation:

To operate the WF-600T series, turn it on by using the ON/OFF/REMOTE switch. The inverter is now ready to deliver AC power to your loads. If you are loading several appliances, turn them on separately after the inverter switch on; this process is to avoid the power inverter delivers the starting current once to all the loads.

5-1. Controls and indicators:

The ON/OFF switch is turns on/off the control circuit of the power inverter. If connect to power inverter, the WF-600T Inverter operates input voltage ranges as follows:
10.5 to 15.0 VDC for 12V models
21.0 to 30.0 VDC for 24V models

The WF-600T Inverter indicates DC voltage status as follows:

Model	DC Input over voltage shut-down	DC Input under voltage alarm	DC Input under voltage shut-down
WF-600T-112	15.3	11.0	10.5
WF-600T-124	30.6	22.0	21.0

5-2. System Status LEDs.

There are 3 LED indicators are located on the front panel of inverter, Input Level, Load Level, and Power status.

1. Input Level: Display Input Voltage

LED Status	DC 12V	DC 24V
Red Blink (slow)	10.5~10.9	21.0~21.8
Red	10.9~11.3	21.8~22.6
Orange	11.3~12.0	22.6~24.0
Green	12.0~14.0	24.0~28.0
Orange Blink	14.0~14.7	28.0~29.4
Red Blink	14.7 ↑	29.4 ↑

2. Load Level: Display AC Load Watts

LED Status	Load Condition
Dark	0~30W
Green	30W~200W
Orange	200W~450W
Red	450W~580W
Red Blink	Over 580W

3. Power status: Display power good / fault status

LED Status	Power Status
Green	Supply AC power from an external AC source
Orange	Supply AC power from an inverter.
Red Blinking Fast	OVP: over voltage
Red Blinking Slowly	UVP: under voltage
Red Blinking Intermittently	OTP: over temperature
Red	OLP: over load

6. Information

6-1. Troubleshooting:

WARNING
Do not open or disassemble the WF-600T Inverter. Attempting to service the unit may result a risk, electrical shock or fire.

Problems and Symptoms	Possible Cause	Solutions
No output voltage, the LED glows RED light.		
a. Power status light is blinked fast.	Over input voltage.	Check input voltage Reduce input voltage.
b. Power status light is blinked slowly.	Low input voltage.	Recharge battery. Check connections and cable.
c. Power status light is blinked Intermittently.	Thermal shutdown	Improve ventilation. Make sure ventilation, openings in inverter are not obstructed. Reduce ambient temperature.
d. Power status light is glowed steadily.	Short circuit, Wiring error. Over Loading	Check AC wiring for short circuit. Reduce load.

6-2. WFCO Power Inverter :

WFCO extends, to the original owner, a Limited Power Inverter Warranty commencing from the original date of purchase for a period of two (2) years. This limited warranty is extended specifically for and is limited to Recreational Vehicle application and is only valid in the continental United States, Alaska, Hawaii and the Provinces of Canada. WFCO warrants, to the owner, that it's Power Inverter is free from defects in material and workmanship under normal use and service based on its intended use and function and is limited to the repair or replacement, at its discretion, of any defective part or defective assembly. Any implied warranties of merchantability and fitness for intended use are limited in duration unless applicable State Law provides otherwise. You may have other right as specified by each individual state.

6-3. Exclusions and limitations :

The OEM warranty specifically does not apply to the following :

* Any Power Inverter that has been repaired or altered by an unauthorized person.
* Any damage caused by misuse, faulty installation, testing, negligence or accident or any Power Inverter installed in a commercial vehicle.
* Any Power Inverter whose serial number has been defaced altered or removed.
* Any consequential damages arising from the loss of use of the product including but not limited to : inconvenience, loss of service, loss of revenue, loss or damage to personal property, cost of all services performed in removing or replacing the WFCO Power Inverter.

6-4. Warranty:

Upon determination and validation by the OEM dealer that a WFCO Power Inverter has a defect, the dealer shall contact the WFCO warranty service number (800) 900-2468 and obtain a return goods authorization (RGA) number. This number shall appear on all correspondence with warranty service. Upon validation warranty service shall replace the Power Inverter with a like product. The RGA number shall also be placed on the outside of the carton used to return the product for ease of identification. Do not mark on the Power Inverter.